

US EPA ARCHIVE DOCUMENT

Developing a Rapid Assessment Method: The California Experience



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San Francisco Estuary Institute

Impetus

Political will to change land use

Public's interest in "ecological health" and "restoration"

Lack of accountability

Public's need to know what it's gotten for its investments

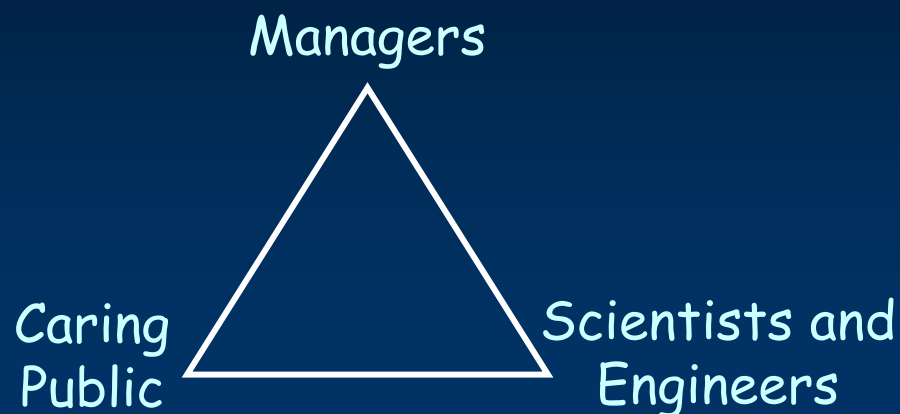
Inability to show progress and sustain political will

Lack of consistency among existing methods, unavailability of data, prohibitive cost of adequate coverage

USEPA incentives

Wetlands "Elements Letter"

Key Questions and Issues



Where are the wetlands and riparian areas?

How are they doing?

Are the policies and programs working?

Is the project successful?

What about climate change?

Funding

2002-2009: 2.75 million

Federal

CWA 104b3 (USEPA), Coastal Services Program (NOAA),
National Wetlands Inventory (USFWS), Point Reyes
National Seashore (USNPS)

State

Coastal NPS Program, Legacy Program, State 404 Program

NGO

Riparian Habitat Joint Venture, Association of Bay Area
Governments

Foundations

Packard Foundation, SF Foundation, Rose Foundation

In-Kind Services

Data and expertise are provided by:

Cities, counties, special districts, regional agencies, state and federal agencies, NGOs, academia, private engineering and environmental firms

Championship

Not a project but a process

Not a product but a program

It's not agencies but people

Developmental Organization



Part of a Developmental Framework for Comprehensive Assessment and Monitoring

- Level 1:** Landscape assessment based on the distribution, abundance, shape, size-frequency, etc of wetlands (e.g., NWI, Ca Wetland Inventory).
- Level 2:** Rapid assessment using checklists or other semi-quantitative devices to score wetland sites relative to a range of condition from least impacted to highly degraded (e.g. ORAM, CRAM).
- Level 3:** Evaluation of ecological services in their own regard (e.g., Unit Hydrograph, IBI's) and to validate Level 1 and Level 2 results

Goals:

Increase State Capacity to Address Key Questions and Issues

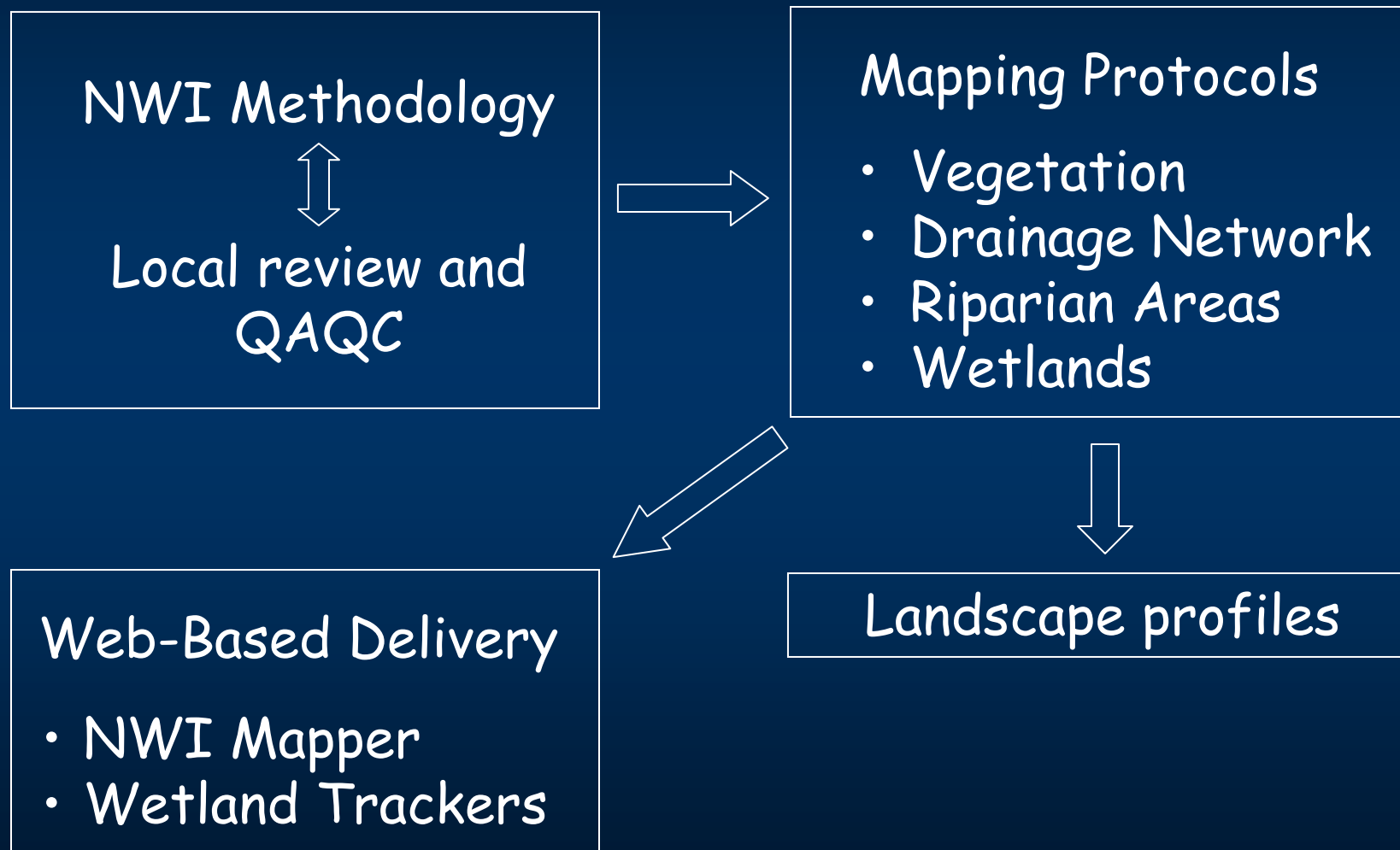
- Develop State Wetland and Riparian Inventories
- Help standardize project assessment in the context of ambient monitoring
- Help assess the performance of wetland and riparian policies and programs

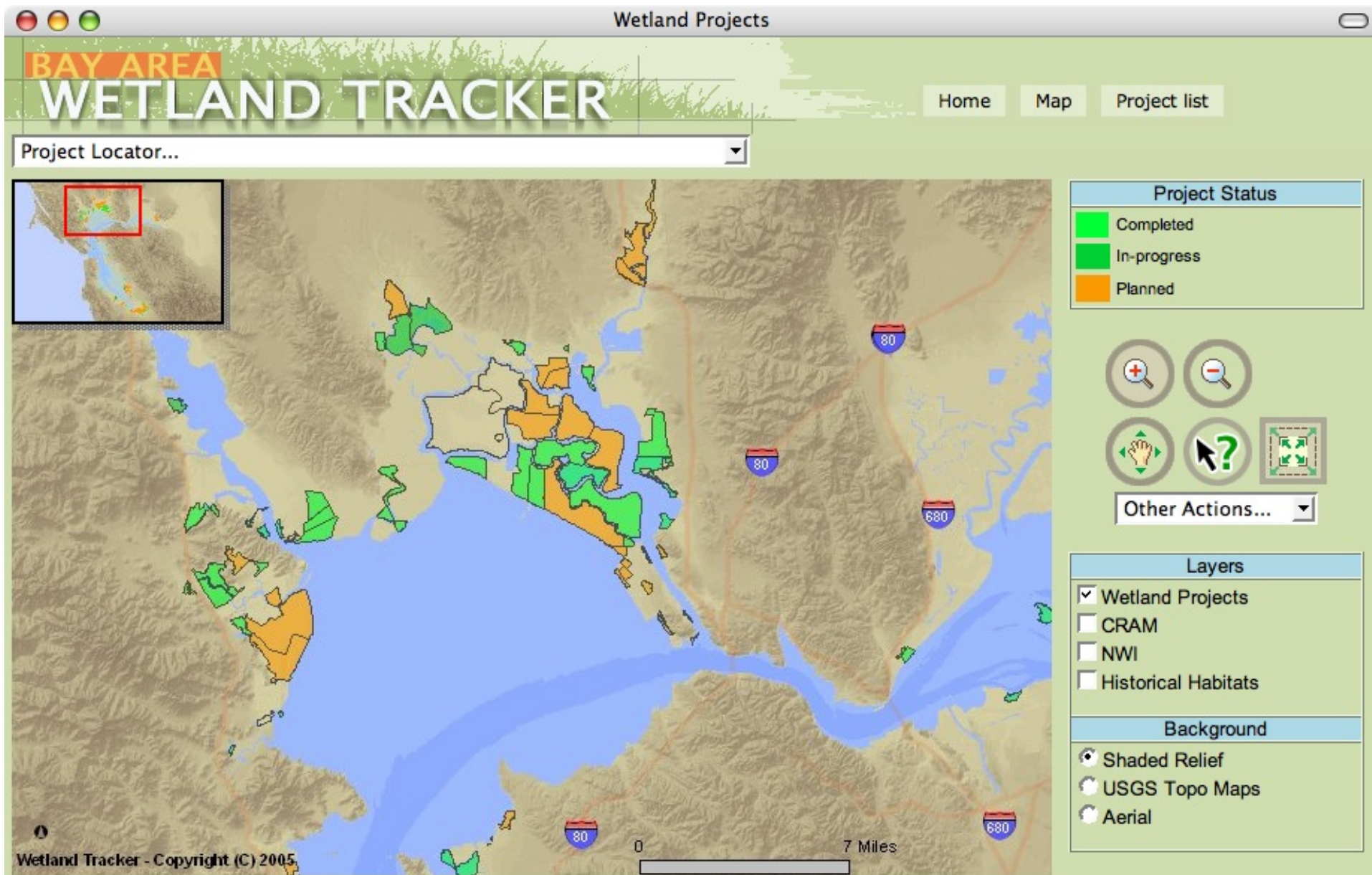
All Types of California Wetlands

- Lakes and Lagoons
- Estuaries
- Steams and Riparian
- Slope Wetlands
- Depressional Wetlands
- Vernal Pools
- Playas
- Wet Meadows

Focus on Coastal Watersheds

Development of Level 1 Inventory





Updates linked to Ca 401 Certification Program

Development of Level 3 Tools: Protocols for Assessing Ecological Service

Protocols vetted with local, state and federal agencies through broadly inclusive science teams

Examples from other projects and programs:

- Stream Macroinvertebrate IBI
- Tidal Datum Updates
- Sentinel Species for bioaccumulation

Development of Level 2 Tool: California Rapid Assessment Method for Wetlands and Riparian Areas

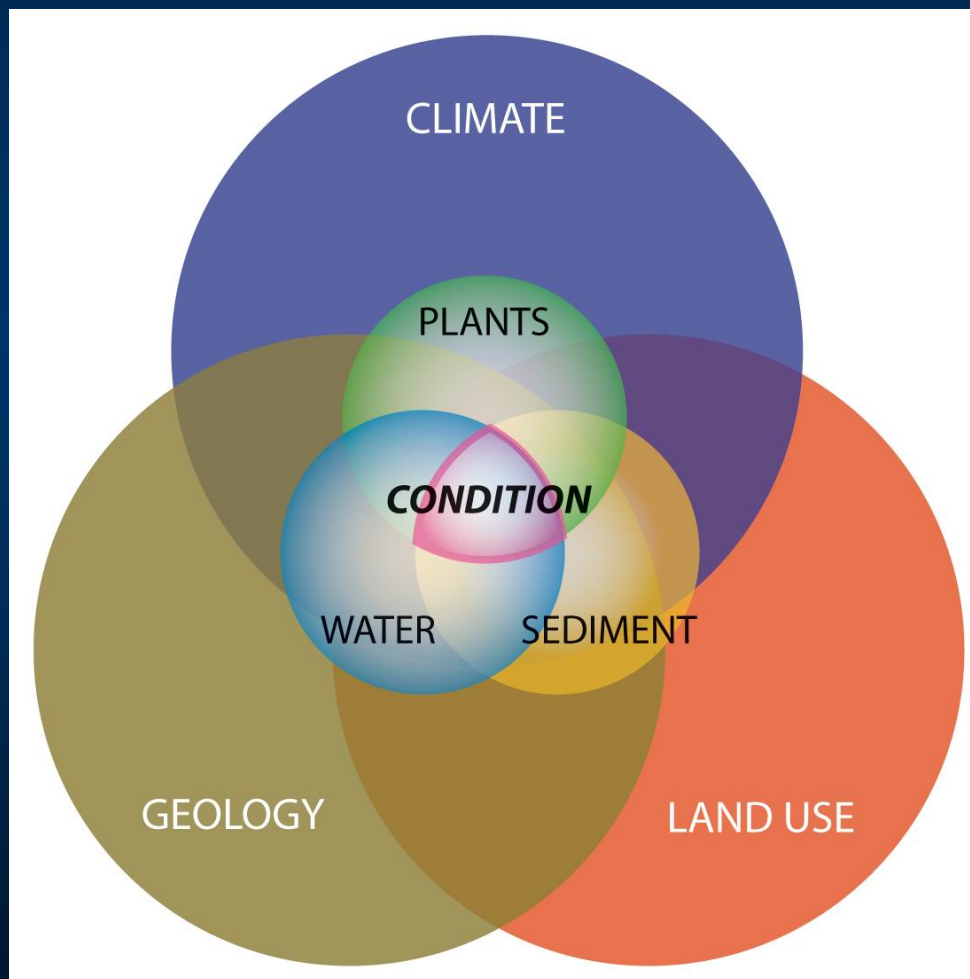
- Establish PI Team, Regional and Statewide Teams
- Develop conceptual models of form and function
- Review other RAMs
- Verify and revise
 - BPJ in the field
- Validate
 - Explore correlation to Level 3 data
 - Test repeatability within and among teams

What is "CRAM"

- Expert "walk and talk" diagnostic tool
- Standard metrics for each wetland type
- Internal reference (scores represent percent of best achievable)
- Less than 4 hrs field time
- Teams of 2-3 trained practitioners

Conceptual Models Reveal Assumptions

Primary and Secondary Drivers of Condition



Stress, Buffer, and Habitat Condition

Stress and disturbance originate in the landscape outside the buffer

Buffer exists between stressors and the wetland



Condition is assessed in the wetland

CRAM Design Template

Wetlands

Assessment Areas for CRAM

Attributes of Condition

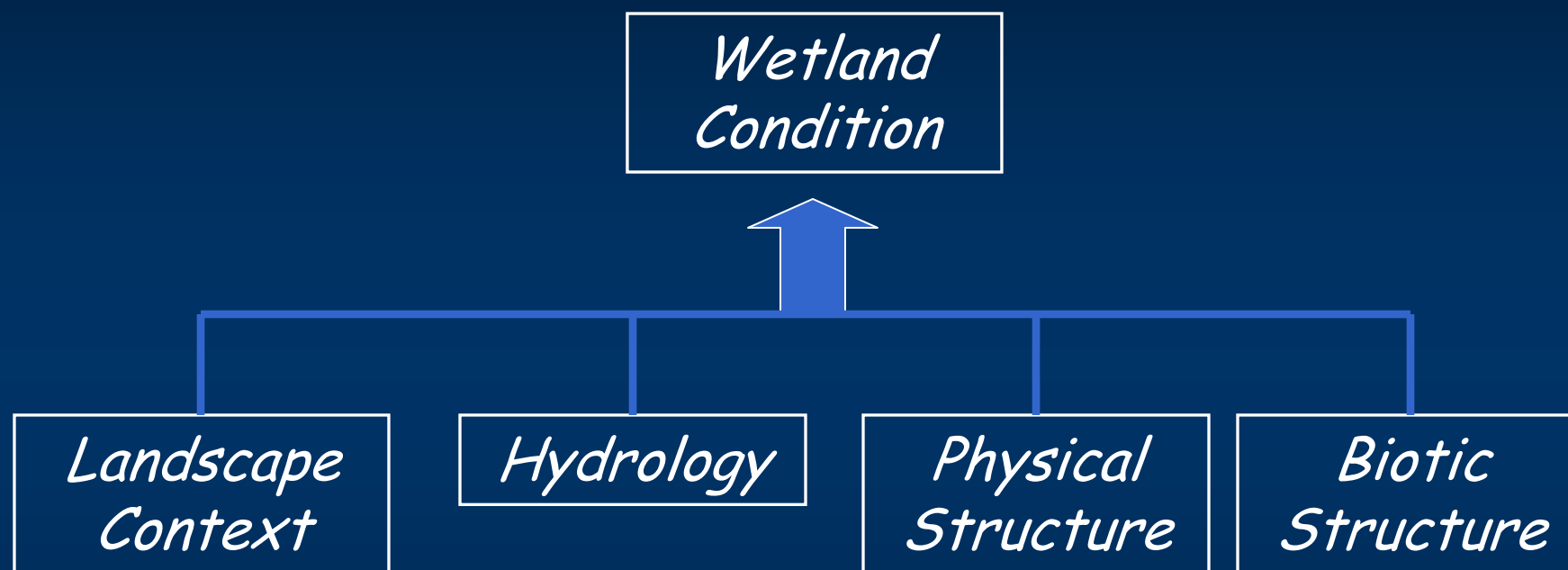
*Same for all
Wetlands
Classes*

Metrics and Sub-metrics

Scores

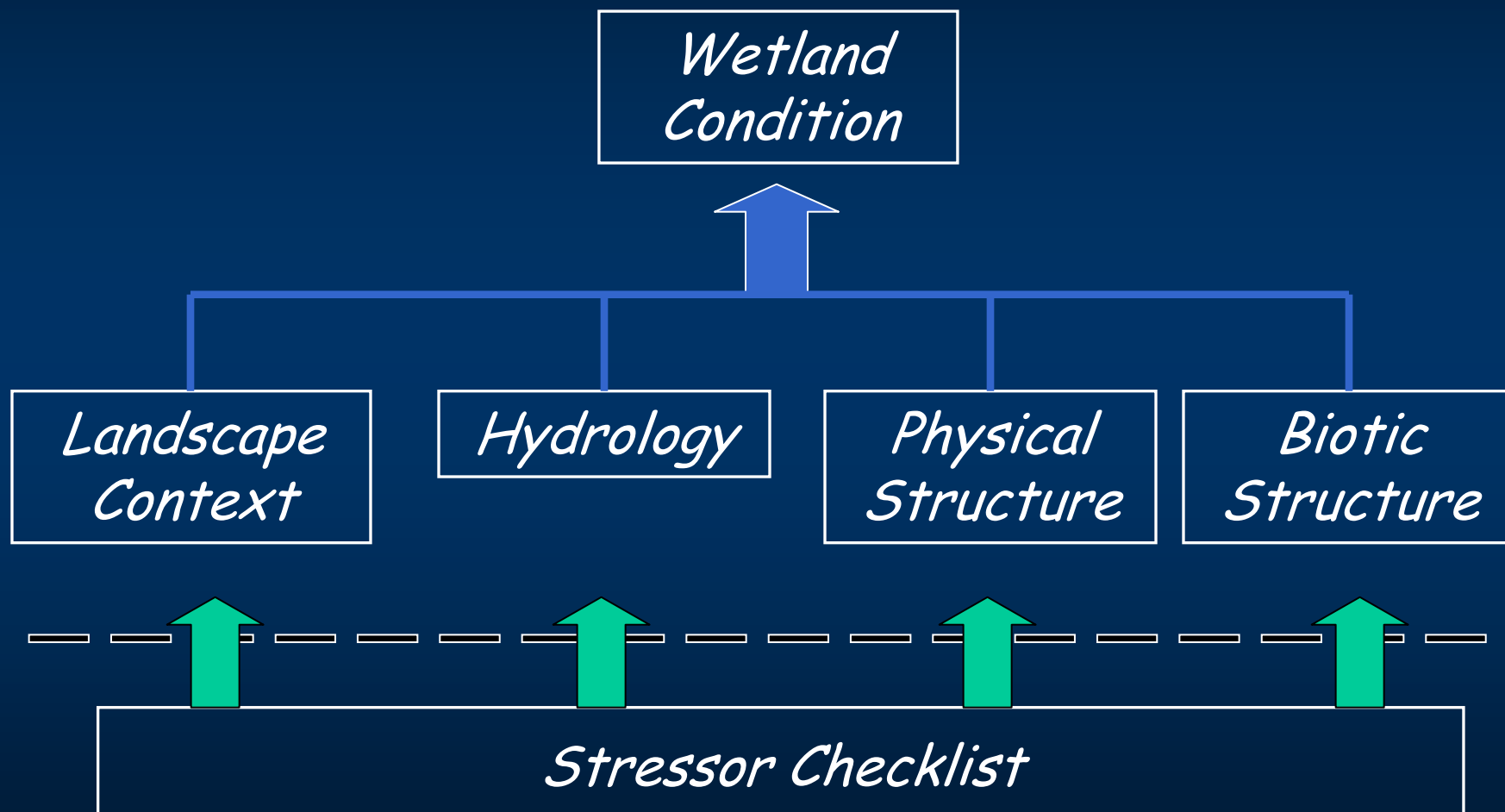
*Vary among
Wetland
Classes*

CRAM Design Template



- Four attributes of wetland function contribute to the overall wetland condition
- Scores are recorded for metrics for these attributes

CRAM Design Template



Uses of the Stressor Checklist

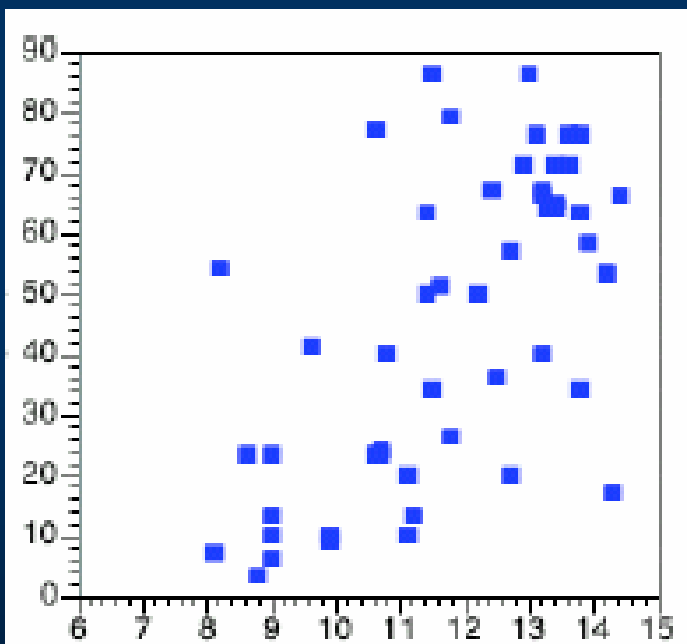
- Identify possible causes for low CRAM scores
- Identify possible corrective actions
- Develop testable hypotheses relating scores to stressors



Validation: CRAM Correlation to Level 3 Data

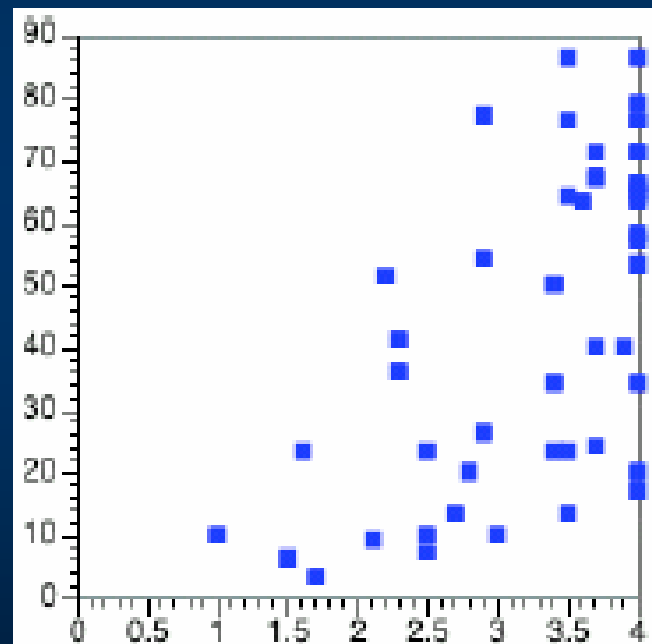
Macroinvertebrate IBI

Overall CRAM Score



$$p = 0.001$$
$$r^2 = .66$$

Landscape Attribute



$$p = 0.001$$
$$r^2 = .62$$

Validation: CRAM Correlation to Level 3 Data

CRAM Score	Level 3 Data	r^2	p-value
Landscape	Diversity of non-riparian bird species	+.39	.01
Hydrology	Total bird species diversity	+.32	.04
Physical	Macroinvertebrate IBI	+.35	.01
Biotic	Macroinvertebrate IBI	+.40	.003
Overall	Macroinvertebrate IBI	+.62	.001

Validation: Repeatability within and among Teams

Precision Test	Precision Targeted	<u>Precision Achieved</u>	
		Estuarine	Riverine
Within Team	+/- 10%	11%	7%
Among Teams	+/- 20%	8%	12%

CRAM Display - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cram.sfei.org/cramdisplay/

Getting Started Latest Headlines

CRAM IT: CRAM Software and Web-Based Information Management

Select a site ...

Map Satellite Hybrid

Site Name: Carpinteria Salt Marsh
Wetland Class: Estuarine
Visit Date: 06/21/2005
CRAM Site Score: 81.8
[View Chart](#)

Estuarine ☒
Riverine ☐
[Reset Zoom](#)

zoom	Site Name	Visit Date	CRAM Score
	null	null	null
	Upper Petaluma	09/14/2005	86.5
	Nana Pond 2A	09/14/2005	84.4

POWERED BY Google

Done

start

3 Microsoft Office P... Wetlands Projects - ...

CRAM Display - Mozill... friday agenda - Micro...

9:18 PM
Wednesday
5/24/2006

CRAM Display - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cram.sfei.org/cramdisplay/

Getting Started Latest Headlines

Map Satellite Hybrid

Site Name: Carpinteria Salt Marsh
Wetland Class: Estuarine
Visit Date: 06/21/2005
CRAM Site Score: 81.8
[View Chart](#)

Zoom to AA ...

Estuarine ☒
Riverine ☐
[Reset Zoom](#)

zoom	Site Name	Visit Date	CRAM Score
	Bolsa Chica	09/01/2005	69.8
	Carpinteria Salt Marsh	06/21/2005	81.8
	Mugu 1	07/08/2005	86.5

Done

start

Microsoft Office P... Wetlands Projects - ...
CRAM Display - Mozill... friday agenda - Micro...

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Wednesday
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Carpinteria Salt Marsh

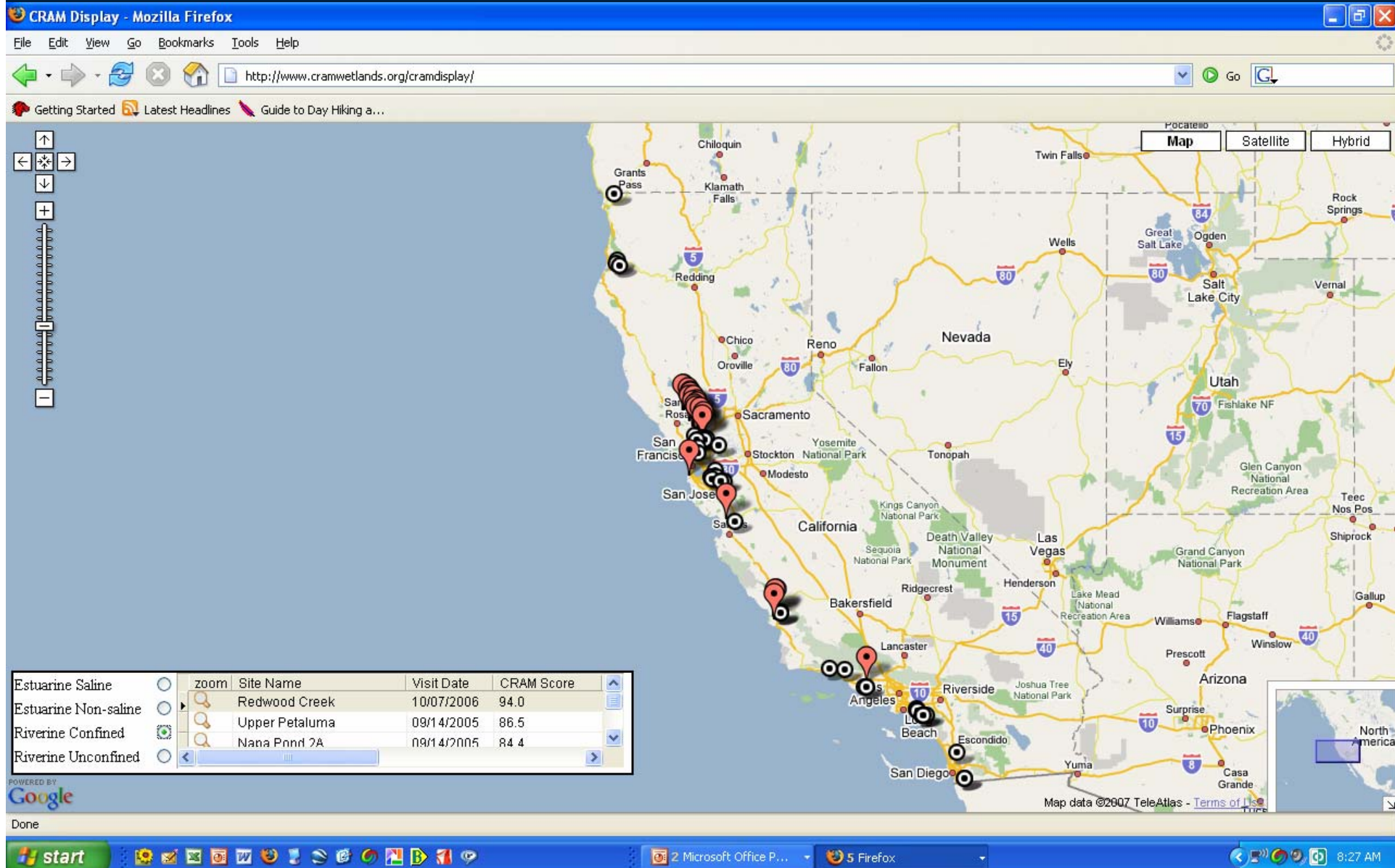
Statewide Average*

This Site



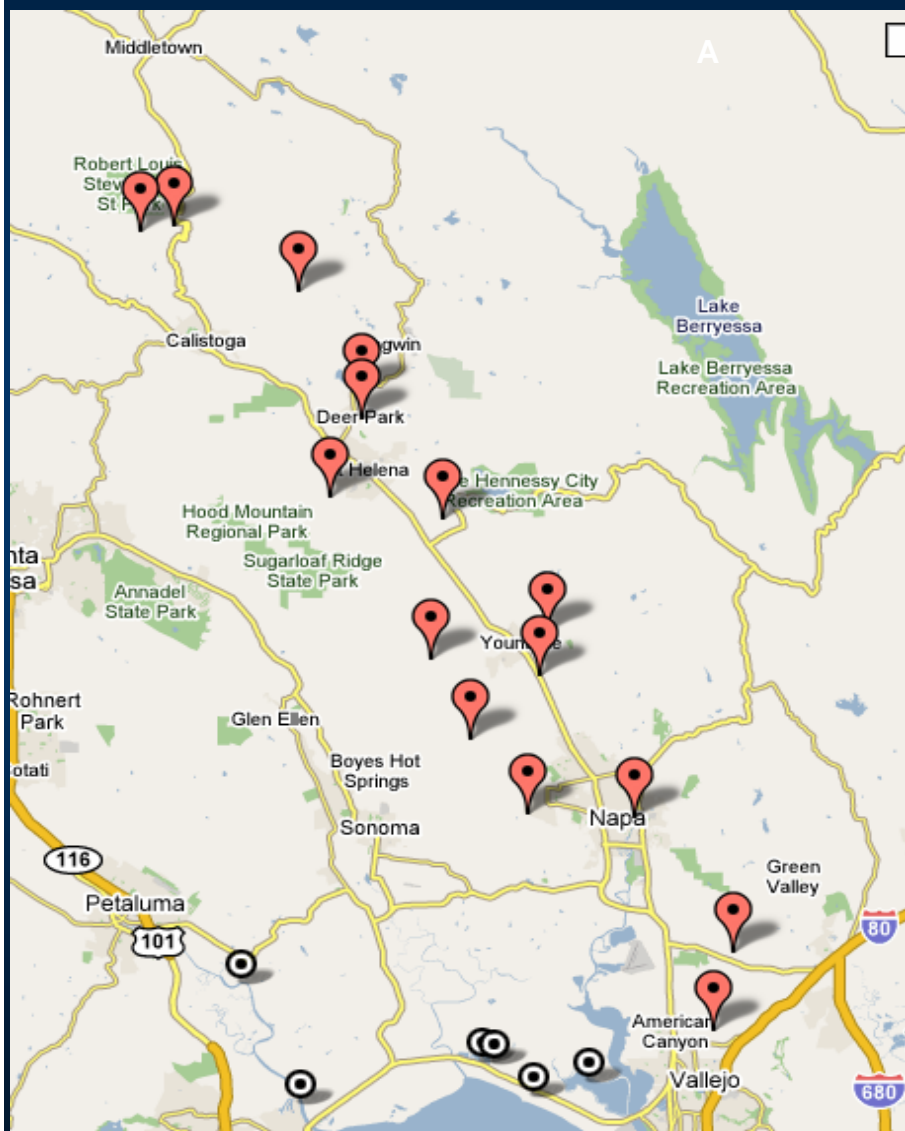
*Statewide average is based on CRAM calibration data.

Ambient Surveys

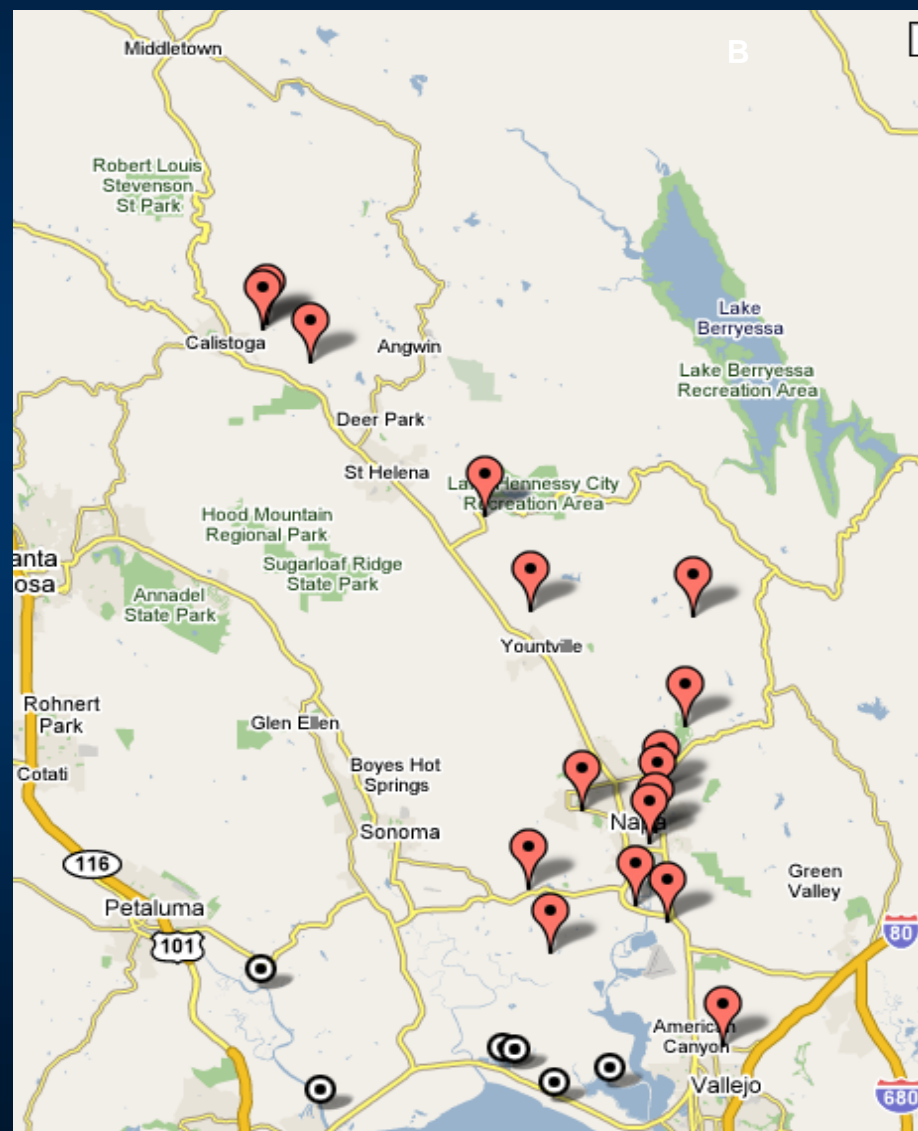


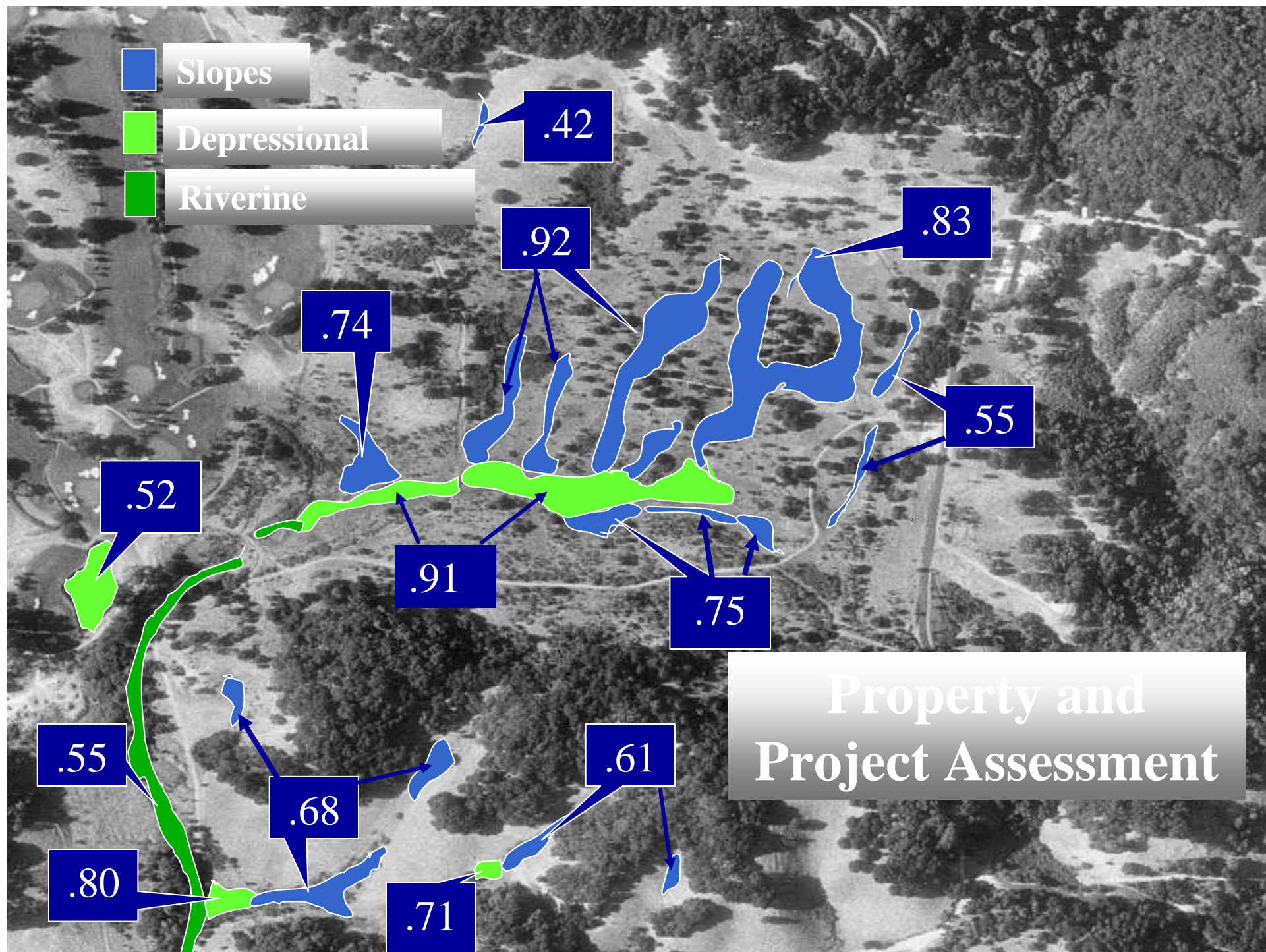
Watershed Profiles

Confined Riverine



Unconfined Riverine





CRAM Highlights

- Applicable across policies, programs, projects
- Applicable across landscapes and wetland types
- Provides immediate and transparent results
- Separates likely stressors from condition
- Correlates to ecological services

Status of CRAM Development

- CRAM Manual: Complete for all wetland types
- CRAM IT: Complete for all wetland types
- Verification: Complete for all wetland types
- Validation: Complete for riverine and estuarine

Current and Pending Applications

- Program Performance Assessment
 - State 404 Certification Program
 - State Stream Bed Alteration Permit Program
 - State Net-gain Policy
- Impacted and Mitigation Site Assessment
 - Sacramento and Los Angeles USCACE
 - State Water Resources Control Board
- Restoration Site Assessment
 - State Coastal Conservancy
 - State Coastal Commission
 - Some Tribes (Yurok, Washo)

Current and Pending Applications

- **Parklands and Refuge Assessment**
 - Selected State Parks
 - State Fish and Game Refuges and Preserves
 - Wetland Mitigation Banks
 - Selected National Parks and Seashores
- **Ambient Assessment**
 - 30+ CMAP wadeable stream sites 2007
 - 120+ statewide estuarine survey sites in 2007
 - 6-8 watershed assessments 2007-09
 - Adapted to Gulf Coast and Northwest Coast 2007

Next Steps for CRAM

- Training and Certification
 - "As needed" training through 2007
 - Training and Certification through University Extension Services beginning 2007
- Peer Review
 - Rapid Assessment in California (Sutula et al. 2006)
 - Mitigation Project Review (Ambrose et al. 2006)
 - CRAM Validation (Stein et al. in preparation)

Numerous Investigators with Federal and State Oversight

PI Group

Josh Collins, Cristina Grosso, Letitia Grenier *SFEI*

Martha Sutula, Eric Stein, Betty Fetscher *SCCWRP*

Ross Clark *Ca Coastal Commission*

Adam Wiskind *MLML*

Regional Teams (10-20 members each)

South Coast, Central Coast, Bay Area, North Coast

Statewide Steering Committee

USEPA, USACE, USNPS, NRCS, Resources Agency,
State Water Board, CalTrans, CDFG, Coastal
Commission, Coastal Conservancy

Thank you

